

Under bed rest and iodids, the right eye rapidly came back to its usual position, and in three weeks there was no demonstrable exophthalmos, nor has there been any since. A subtotal thyroidectomy was advised, but refused.

CASE 2.—The second case was brought to my attention by Dr. C. M. Fox. The patient was a married woman of twenty-four, first seen October 14, 1926. Her chief complaints were exophthalmos of the right eye, present for four weeks, a rapid pulse and nervousness. Examination showed an exophthalmos of two millimeters in the right eye, but no other ocular abnormality. The various lid signs were entirely absent in the left eye. The fundi showed no change. Muscle balance was essentially normal, the convergence near point being ten millimeters, and visual acuity in each eye was 20/15. The thyroid was uniformly enlarged, there was a fine tremor, and the pulse rate was 124. The basal metabolic rate was plus 38. Nose and throat examinations were negative. X-ray graphs of the orbit and sinuses showed no pathologic changes. A month later, after rest and iodids at her home, the exophthalmos had disappeared, and her general health was much improved. Thyroidectomy was also refused in this case.

#### COMMENT

While these two records are inconclusive, both would seem to have been caused by hyperthyroidism alone, although other conditions cannot absolutely be ruled out. They at least suggest the necessity of investigating the condition of the thyroid before attempting, in unilateral exophthalmos, to make a diagnosis of the underlying pathologic changes.

1304 Medico-Dental Building.

#### DISCUSSION

FREDERICK C. CORDES, M. D. (384 Post Street, San Francisco).—It is well to have our attention called to the possibility of a toxic goiter being the cause of unilateral exophthalmos. As ophthalmologists, who see relatively few cases of this type, we are apt to draw the conclusion that unilateral exophthalmos is rare in this disease.

Where a relatively large number of toxic goiters are seen it is found that approximately one per cent of these show unilateral exophthalmos. In about five per cent of the cases the exophthalmos is more marked on one side.

The thyroid surgeons feel that acquired exophthalmos (exclusive of the cases where there is orbital pathology) is due always to hyperplasia. Their opinion is that this also applies to the unilateral cases of exophthalmos that have been attributed to pressure on the cervical sympathetic by an adenoma of the thyroid.

✱

DOHRMANN K. PISCHEL, M. D. (490 Post Street, San Francisco).—Monocular exophthalmos in toxic goiter was noted as long ago as 1846, when the Viennese ophthalmologist, Von Sichel, working in Paris, described such a case. Since then many have been reported, Sattler in 1907 having collected 109 cases from the literature.

Statistics as to the percentage of such cases among patients with exophthalmos differ greatly, varying from 1 to 10 per cent. By a small percentage the majority of cases of monocular exophthalmos are right-sided. In many cases a one-sided protrusion of months or even years' duration precedes a final bilateral exophthalmic state.

The relation of monocular exophthalmos to asymmetrical enlargement of the thyroid gland is interesting. Usually the exophthalmos is present on the same side as the greatest enlargement, but in a surprisingly large percentage of cases the signs may be crossed. Furthermore, after resection of one side of the gland,

the exophthalmos on that side frequently disappears entirely, whereas that on the opposite side remains stationary.

✱

A. RAY IRVINE, M. D. (1142 Roosevelt Building, Los Angeles).—Exophthalmos of both eyes, in which the exophthalmos is more pronounced in one eye, has been frequently observed. In my experience I have only had one case in which the protrusion occurred in one eye only. This man, age sixty-four, was seen for the first time in August, 1927. The exophthalmos was very marked in the left eye, so much so that there was difficulty in closing his eye. The fundus was normal. All other examination, including x-ray, excluded any local condition which might be a cause. General examination showed a slight tremor, paroxysmal tachycardia, six pounds loss of weight, moderate goiter of an adenomatous and cystic type. The internist, after metabolism and other tests, concluded that the goiter was toxic and advised its removal. The patient made an uninterrupted recovery, gained in weight, and improved generally. But the exophthalmos still persists. There has been no exophthalmos in the right eye.

#### RADIATION TREATMENT OF UTERINE FIBROMYOMATA\*

By ALBERT SOILAND, M. D.  
WILLIAM E. COSTOLOW, M. D.  
AND  
ORVILLE N. MELAND, M. D.  
Los Angeles

DISCUSSION by Clarence G. Toland, M. D., Los Angeles;  
L. A. Emge, M. D., San Francisco; William Henry Gilbert, M. D., Los Angeles.

DURING the past ten years radiation has been definitely established as a method of treatment for uterine fibromyomata. Gynecological literature from all parts of the world has been replete with reports regarding the successful use of radiation in this condition, and it has been adopted in all intelligent and well-informed medical centers. It is, therefore, no longer necessary to argue the value of this method of treatment in uterine fibromyomata, but simply to define the limitations of its use, determine the cases which are best suited for radiation treatment, and those best suited for surgery.

Some gynecologists with steadfast surgical inclinations, and experience in the radiation treatment of only a small number of cases, have attempted to limit the radiation field so rigidly that only a small percentage of cases would be radiated. Experiences with large numbers of cases, however, show that this rigid limitation is not necessary; Beclere even stating that his experience in seven hundred cases radiated teaches him that "The only conclusion permissible is that the only obstacle to successful treatment is the submucous myoma." Only nine cases (one per cent), out of his entire series of seven hundred, required surgery later. As early as 1922 we find Howard H. Kelly of Johns Hopkins stating that "He who would give his patients the same consideration he would give his wife or sister must put radium first in the treatment of fibroid tumors. In uncomplicated fibroids, especially when asso-

\* Read before the Obstetrics and Gynecology Section of the California Medical Association at its Fifty-Seventh Annual Session, April 30 to May 3, 1928.

ciated with excessive bleeding, there is no treatment as satisfactory as radium. In our hands there has been, in several hundred cases, no mortality, and the bleeding has been checked in almost every case. The radiation as a rule in no way interferes with or makes more difficult, or contraindicates a later operation if this should eventually prove necessary. I should like to go on record here to the effect that in a high percentage of large tumors there is either a complete disappearance or a marked reduction in size of the large growths."

#### IMPORTANCE OF CORRECT DIAGNOSIS

The correct diagnosis of pelvic pathology is of more importance when radiation is to be used than when surgery is to be the method of treatment, because the surgeon, in the event of his diagnosis being wrong before operation, can see what the condition is after the abdomen is opened. No one is justified in applying radiation treatment without training in pelvic diagnosis and without having used every method of careful pelvic examination to determine, as accurately as possible, the differential diagnosis of the type of fibromyoma and associated pelvic pathology.

#### SELECTION OF CASES

Some submucous fibroids may be treated with better results by surgery than by radiation, but this is not by any means always true. A submucous fibroid which is pedunculated and protruding from the cervix is, of course, more easily removed by means of surgery, but we have several of these cases in our series where operation was contraindicated, and where a combination of radium and x-ray treatment was successful. It is not always best to use radium in the submucous fibroid cases, but x-ray therapy may be used without fear of causing local necrosis or sloughing.

Some writers have attempted to limit the use of radiation in fibromyomata to growths which are not larger than a four months' pregnancy. Undoubtedly the results of radiation are more certain in tumors of this size than in the large tumors. A large, uncomplicated fibroid, however, may be caused to entirely disappear, or may be reduced so much in size as to render it symptomless. Large fibroids causing acute pressure symptoms may best be relieved by surgery if there is no contraindication, as relief by means of radiation is slower. Many of the large multiple growths in our series, a number of which were pedunculated, entirely disappeared, while others were reduced to such a small size as to be without symptoms.

Surgery should be considered first when a definite ovarian cyst can be made out, complicating a fibroid, and producing symptoms, because the cyst will not respond to radiation.

#### RADIATION IN YOUNGER WOMEN

The operation of myomectomy has been advocated in the case of young women, within the childbearing age, who have fibromyomata so situated that they may be enucleated without deforming the uterus to the extent that childbearing would be impossible. It has been estimated that

probably in only 6 per cent of all cases is this possible (Lockyer). In Mayo's series of 741 myomectomies, 59 (or 7.9 per cent) later became pregnant. Nineteen of the cases of this series came to operation later (mostly for infection), the hazard here being the opening into the uterine cavity. However, as Bland-Sutton states, "Experience teaches this stern lesson; after the enucleation of a fibroid in the procreative period of life, a woman is more likely to grow another fibroid than to conceive successfully."

Six cases in our series had previous myomectomies. The literature reports a number of normal pregnancies in cases where radiation had previously been administered. Of twenty-five married women in our series, where only a temporary amenorrhea was produced, three later became pregnant. If it is necessary for a hysterectomy to be performed in the young woman to remove the fibromyoma, then radiation may as wisely be chosen for the therapeutic agent. After the elimination of the tumor in the young individual, there is a possibility of the menstruation returning and being normal. Even if menstruation does not return, the menopause will not be any different from that produced by hysterectomy. The woman is not unsexed by the radiation, and there has never been any change observed in the secondary sexual characteristics. There is strong evidence to believe that the internal secretory function of the ovary is not destroyed, and that the chief action on the ovary is in the outer graafian follicle layer.

#### OCCURRENCE OF ASSOCIATED MALIGNANCY

The occurrence of malignancy in association with uterine fibromyomata has been greatly exaggerated. It is often mentioned that there is great danger of sarcomatous degeneration. In 1922 Dr. John G. Clark remarked regarding this degeneration in myomata as follows: "If there was ever a fallacy that should be annihilated, this is one. The frequency of sarcomatous transformations in myomata is so small as to be negligible."

There is some danger of carcinoma of the fundus being associated with uterine fibroids, although it is a fairly rare condition. Carcinoma of the fundus should always be borne in mind, especially in the late menopausal years or in cases past the average menopause age. In our series there were only six (or 1.06 per cent) cases with associated carcinoma of the fundus; three of these were past the average menopause age. If careful curettement is done before the radiation treatment this danger can be made negligible. Should irregular bleeding develop later, indicating malignancy, operation can be resorted to, with probably better ultimate success after the preliminary radiation.

In the consideration of malignancy associated with fibromyomata, there is one fact which is often lost sight of when subtotal hysterectomy is performed; namely, the frequency of the later occurrence of carcinoma in the cervical stump left behind. In a study of the literature, Polak mentions 256 cases of cancer of the stump, all

of which occurred after one year. In our clinic, in the past six years, we have seen eighteen cases of carcinoma of the cervical stump in patients who had previously had subtotal hysterectomies for uterine fibromyomata. So far as we know, carcinoma of the cervix has never occurred later in any of our cases of uterine fibromyomata treated by radiation. After combined radium and x-ray treatment of fibromyomata, the cervix is left small, atrophic, and fibrous. The danger of later development of carcinoma is certainly greatly lessened, if it ever occurs.

#### PELVIC INFLAMMATION ASSOCIATED WITH UTERINE FIBROMYOMATA

Some gynecologists have claimed that associated pelvic inflammation is a contraindication to the radiation treatment of uterine fibromyomata. We believe that the intra-uterine use of radium, following curettement, would be unwise in the presence of definite palpable pelvic inflammation; the curettement alone would probably be sufficient to stir up an acute inflammation. However, we do not believe that the associated pelvic inflammation is any contraindication if deep x-ray therapy is used. The deep x-ray therapy is probably one of the best methods of dealing with the associated pelvic inflammation. In this connection it must also be remembered, as stated by Pankow, that the cases with associated pelvic inflammation are the ones which make the operative treatment more difficult and contribute most to the operative mortality of myomas. Ford has shown in the study of a series of cases of uterine fibromyomata, operated at the Mayo Clinic, that there was some degree of associated pelvic inflammation in 40 per cent of the cases. In a corresponding group of 344 cases treated by radiation it was also observed that there was not any evidence of an exacerbation of an inflammatory process. Pelvic inflammation must certainly also have existed in a corresponding percentage of these cases. In the intra-uterine use of radium, in 315 cases in our series, we did not see any evidence of an acute exacerbation of a pelvic inflammatory process. A great many of these cases must have had some associated pelvic inflammation.

#### SEVERE ANEMIA ACCOMPANYING UTERINE FIBROMYOMATA

Anemia was a symptom of serious consideration in seventy-eight of our cases; the majority of these being victims of a chronic menorrhagia which had lasted many years and had produced a definite anemia, with signs of cardiac degenerative changes. A number of these, especially the twelve with hemoglobin below 25 per cent, were positively inoperable. One patient with a hemoglobin of 17 per cent was practically moribund when the intra-uterine radium was applied; she completely recovered and her general condition is splendid at the present time. In this entire group of seventy-eight cases not a single case was required to go to operation later for any complication. All of the seventy-eight are entirely well with the exception of one patient who had 18 per cent hemoglobin when treated, and although she

showed some improvement, died four weeks later from the effects of her severe anemic and cardiac damage. Surgical operation certainly could not have been performed with the hope of success in nearly so many cases of such a serious group.

#### METHODS OF TREATMENT

The following four methods of radiation treatment of uterine fibromyomata may be employed:

1. So-called low voltage x-ray therapy.
2. High voltage or deep x-ray therapy.
3. Radium therapy.
4. Combined radium and high voltage x-ray therapy.

We shall briefly consider the indications for the use of these various methods.

1. *Low Voltage*.—With this method the type of x-ray transformer employed in diagnostic x-ray work, capable of from 100 to 140 k. v., is used. With a filter of at least one-half millimeter of copper, together with proper focal skin distance, deep therapy may be simulated, but with a machine of this output it is necessary to prolong the treatment. If lighter filter is used the skin is apt to be damaged. Too much treatment is often given to the skin and too little to the tumor and ovaries. It is from the haphazard method used by some general practitioners and radiologists doing diagnostic x-ray work on fibroid cases at spare times that most of the harm and unsatisfactory results from radiation treatment are obtained. Some of the earlier cases in our series were treated by the low voltage method, but we have long since discontinued its use. With the present-day availability of the deep therapy apparatus there is no excuse for the use of the smaller type machines in the treatment of uterine fibromyomata.

2. *High Voltage*.—The high voltage or deep therapy method is practiced with a transformer capable of producing at least 200 k. v., and at least one-half millimeter of copper filter is used. With this method there is absolutely no danger of immediate or remote skin or tissue injury; not even a skin reaction is produced, inasmuch as doses much below the skin erythema dose are used. By this means the treatment can be given quickly and accurately. This is the method of choice in the larger fibroids; used alone or in combination with radium.

3. *Radium*.—The use of radium is confined chiefly to the smaller fibroids. One of the important advantages of the radium is that the dosage may be exactly determined. It is also sometimes desirable to have the direct action on the irritated or suspicious cervical tissue.

4. *Radium With X-Ray*.—The combined radium and deep therapy x-ray is undoubtedly the method of choice in the great majority of cases. By using both agents small doses of each may be administered so that any danger from either element is absolutely eliminated. By the combined method both the direct action on the tumor cells by the radium and the indirect action on the ovaries by the x-ray may be obtained. It

is believed that the reduction of the size of fibromyomata takes place both from the direct action of the radiation on the tissue cells of the growth and from the action on the graafian follicle layer of the ovary. Often when x-ray is used alone the menstrual function is checked by its action on the ovary without very marked change occurring in the size of the tumor mass. If the action of the radium is added, the reduction of the size of the growth is more certain on account of its more direct effect on the tumor cells. The atrophy of mucous glands of the cervix by radium is an added precaution against later development of carcinoma. Also, with the intra-uterine use of radium, curettement is usually performed, which makes accurate diagnosis more certain. We believe that anyone attempting radiation treatment of uterine fibromyomata should be equipped with both radium and x-ray, and be familiar with the use of each agent.

#### REVIEW OF RESULTS OF TREATMENT

Our office records show that more than twenty years ago definite attempts were made by one of us (Soiland) in the treatment of uterine fibroids by radiation. There were enough good results obtained to demonstrate the fact that this method of treatment had merit, and that it only depended upon the proper knowledge and understanding of the agencies with which we were working to be rendered more effective.

From about the year 1902 to 1920 a great number of fibroid patients were treated by more or less scientific radiation, probably less than we were then willing to admit, but no attempt has been made to obtain any statistical data from this number on account of our unreliable technique, as well as the fact that it would be impossible to trace a sufficient number of these early cases to make any logical statements of end-results.

As the years advanced, however, it became evident that the method was right, and that a great many women were being relieved of serious conditions which previously could only be approached by surgery.

The study of cases which we present in this article begins with cases treated in 1921. Since this time radiation technique has been better standardized, apparatus more scientific, and consequently results more uniform. We have included in this series only cases where there was evidence of a definite fibroid growth in the uterus. A large number of cases of menorrhagia or benign

bleeding, without definite demonstrable pathology of the uterus, have been excluded.

The appended tables are a review of the 604 cases of uterine fibromyomata referred to in this article.

TABLE 1.—*Numbers and Classes*

1. 604 cases treated from 1921 to 1926.
2. 562 cases traced. 42 cases untraced.
3. Age: Oldest 63. Youngest 20. Average age 43.2 years. 53 cases between ages of 20-35. 113 cases between ages of 35-40.
4. Married: 515. Single: 47. (Only 8 of the single cases between ages of 20-35.)
5. Married cases without children: 185.
6. Cases showing marked anemia: 78. 22 cases less than 40 per cent hemoglobin. 12 cases less than 25 per cent hemoglobin. (One case of 18 per cent hemoglobin died four weeks after last treatment.)

TABLE 2.—*Symptoms*

1. Menorrhagia .....	320 cases (56.9 %)
2. Pressure .....	11 cases ( 1.9 %)
3. Dysmenorrhea .....	5 cases ( .83%)
4. Menorrhagia and metrorrhagia .....	125 cases (22.29%)
5. Menorrhagia and pressure .....	88 cases (15.68%)
6. Menorrhagia and dysmenorrhea .....	13 cases ( 2.4 %)

#### GENERAL SUMMARY OF THE FIVE HUNDRED AND SIXTY-TWO CASES, TRACED

The tables are self-explanatory, but a few additional facts may be mentioned.

In five cases in younger women with small fibroids who gave dysmenorrhea as their only symptom and had a return of menstruation after the treatment, four were found to be entirely relieved of the dysmenorrhea.

In only one case of the entire series was pregnancy associated with the fibroid condition. This case, with a subserous fibroid, was in the second month of pregnancy when treated and miscarried six weeks after the last deep therapy x-ray treatment. She had a four-plus Wassermann reaction and had miscarried three times previously.

In the majority of the cases where the tumor was still at least 50 per cent of its former size, the patients were treated in the years 1924, 1925, and 1926. Very few of the cases treated in the years 1921, 1922, and 1923 showed so much enlargement; apparently it takes some time for the complete disappearance of the tumor mass. We believe that if the cases were all studied five years

TABLE 3—PART ONE.—*Change in Size of Tumor after Radiation*

A. Tumors larger than four months pregnancy. 69 cases. (6 cases were operated later.)

	Radium (3 cases)	High Voltage X-ray (39 cases)	Radium combined with high voltage X-ray (27 cases)	Total 69
1. Very little change in size of growth.		4 (10.2%)	2 ( 7.4%)	6 ( 8.7%)
2. At least 50% reduction in growth.		10 (25.7%)	4 (14.8%)	14 (20.3%)
3. Uterus still slightly enlarged.		13 (33.3%)	6 (22.2%)	19 (27.5%)
4. Growth completely disappeared.	3 (100%)	12 (30.8%)	15 (55.6%)	30 (43.5%)

TABLE 3—PART TWO.—*Change in Size of Tumor after Radiation*  
B. Tumors not larger than four months pregnancy. 476 cases. (11 cases were operated later.)

	Low voltage X-ray 30 cases	Radium 154 Cases	High voltage X-ray (155 cases)	Radium combined with high voltage X-ray (137 cases)	Total 476
1. Very little change in size of growth.	1 ( 3.3%)		2 ( 1.3%)		3 ( .64%)
2. At least 50% reduction in size of growth.	2 ( 6.7%)		11 ( 7.1%)	2 ( 1.4%)	15 (3.15%)
3. Uterus still slightly enlarged.	5 (16.7%)	13 (8.5%)	27 (17.4%)	20 (14.7%)	65 (13.6%)
4. Growth completely disappeared.	22 (73.3%)	141 (91.5%)	115 (74.2%)	115 (83.9%)	393 (82.6%)

after treatment, instead of only two years in some instances, it would be found that the greater percentage of the larger tumors would be completely reduced in size.

Bleeding continued in ten cases, necessitating a hysterectomy. Six (1.06 per cent) of these proved to be malignant; carcinoma of the fundus being found (three past fifty-three years of age).

Four cases were operated, two before treatments were completed, and two in less than three weeks after treatment, not allowing sufficient time to elapse to judge the effect of the radiation. In none of these cases was there an urgent indication for operation.

So in the entire series of 562 cases only thirteen (2.3 per cent) actually failed to respond to treatment, although seventeen (3.02 per cent) went to operation; the other 545 cases, or 96.9 per cent, are clinically well.

#### CONCLUSIONS

1. Combined radium and deep x-ray therapy is the best type of radiation treatment in the majority of cases.

2. Radiation therapy is practically specific in controlling that type of hemorrhage which is due to uterine fibromyomata.

3. The majority of fibromyomata larger than a four months' pregnancy may be rendered symptomless by radiation.

4. Radiation is the treatment of choice in fibromyomata not larger than a four months' pregnancy.

1407 South Hope Street.

#### DISCUSSION

CLARENCE G. TOLAND, M. D. (1930 Wilshire Boulevard, Los Angeles).—All cases of fibromyomata

should be thoroughly studied, as to size, accompanying inflammation, if any, the amount of bleeding, and the general condition of the patient, before any advice is given as to the kind of treatment to be used, whether surgery, radium, or x-ray.

Our experience has taught us that if the fibroid is not larger than that of a three to four months' pregnancy, is soft, not pedunculated and bleeding, that the use of radium and x-ray treatments will be very satisfactory. It saves the patient the terrors of an operation, possible complications which might arise from the operation, such as infection, obstruction, and post-operative hernia.

We believe that uterine fibroids associated with carcinoma of the fundus of the uterus should always be operated upon, as it is a known fact that carcinoma in the body of the uterus is more amenable to surgical treatment than carcinoma in any other part of the body. Also that it gives much better curative results than the use of radium or x-ray.

From the diagnosis arrived at from the history and diagnostic curettement (if necessary) we are then able to properly advise our patients as to the best type of treatment.

If, in the late menopausal years, we find small fibroids accompanied by a possible carcinoma, we feel surgery is the proper procedure without a curettement for diagnostic purposes. We feel that such a curettement is dangerous from the point of view of infection and setting free in the circulation of carcinomatous cells.

✱

L. A. EMGE, M. D. (2000 Van Ness Avenue, San Francisco).—The interesting survey presented by the authors brings out again the important point that the successful treatment of uterine fibroids by radiation depends entirely upon proper selection. Quite the same holds true of surgery. Each method has its definite place. After the age of thirty-five, radiation is often preferable to surgery. I believe that radiation should have the second choice under this age, for the

TABLE 4.—*Effect of Radiation Upon Menstruation*  
(Patients under forty years of age)

EFFECT	A. Large fibroids (larger than four months pregnancy)		B. Small fibroids (not larger than four months pregnancy)	
	AGE		AGE	
	20 to 35 (2 cases)	35 to 40 (16 cases)	20 to 35 (51 cases)	35 to 40 (97 cases)
1. Complete menopause <sup>1</sup>	2 (100%)	13 (81.3%)	23 (45.3%)	95 (97.94%)
2. Temporary amenorrhea with return of normal menstruation <sup>2</sup>		3 (18.7%)	28 (54.7%). No case in this group has gone to surgery.	2 (2.06%)

<sup>1</sup> Three cases of pulmonary tuberculosis making permanent menopause desirable.

<sup>2</sup> Three cases from this group later became pregnant, two with normal children, the other case having twins, one normal and the other stillborn.

simple reason that an artificial menopause at that time of life is not always advisable. Neither the psychic make-up of many women—or that of their husbands—takes kindly to a sudden disturbance of endocrine functions. The sex impulse does disappear in certain individuals. Whether this follows the disappearance of the female sex hormone, which may be due to the destruction of the follicular apparatus in certain instances or is due to the marked reduction of the pelvic venous circulation, I am not prepared to say. The patient should have a word in this matter, especially if subject to radiophobia.

There is no doubt a place for myomectomy in the case of solitary tumors. If the patient is desirous of children the question of choice should rest with her or her husband, even if the percentage of ultimate success is rather low, as long as the facts are openly discussed.

Large tumors producing pressure or toxic symptoms from central degeneration are best treated by surgery. The reduction of these tumors is very slow and pressure symptoms are not speedily relieved. Hence, the patient easily becomes restless. Where toxic symptoms exist they are likely to become intensified. I add to this group large calcareous tumors

which do not respond well to radiation. If in doubt as to the existence of such a condition a radiologic investigation will be most helpful. I agree that in extreme anemias radiation should be the matter of choice as an expedient for bleeding, regardless of the size or location of the tumor. But where anemias are due to protein intoxications and not due to bleeding, surgery preceded and followed by transfusion is preferable. It is not a question of enthusiasm for one or the other method, but one of proper correlation of all factors involved. The best method will always be that which serves the patient best. Judging from this report, I believe that the authors have fulfilled this most essential requirement admirably.

✱

WILLIAM HENRY GILBERT, M. D. (746 Francisco Street, Los Angeles).—This paper on radiation treatment of uterine fibromyomata has added to our knowledge of treatment. It has not been long since there was dispute between gynecologists and radiologists as to the best treatment for this condition, one group contending that all cases were surgical, the other believing that many cases were best treated by radiation. This attitude is no longer so much in evidence. The conscientious physician allots all patients to the

TABLE 5.—Patients Going to Later Operation

AGE	SYMPTOMS AND DESCRIPTION OF TUMOR	METHOD OF TREATMENT	INDICATION FOR OPERATION	FINDINGS OF OPERATION
Case 1 46	Menorrhagia and metrorrhagia 6x10 cm. submucous fibroid protruding from cervix	Radium and high voltage x-ray	Continued bleeding.	Mass reduced in size.
Case 2 45	Menorrhagia and pressure; uterus nodular enlarged 2x	Radium	Continued bleeding.	No malignancy found.
Case 3 47	Menorrhagia and metrorrhagia; 4 cm. wide nodule on ant. wall	Radium curettement negative	Continued bleeding for one year.	Carcinoma, fundus found.
Case 4 44	Menorrhagia; uterus size three months pregnancy	Low voltage x-ray	Operated three weeks after last x-ray treatment.	Intramural fibroid found.
Case 5 48	Menorrhagia, uterus nodular enlarged three times	Radium and high voltage x-ray	Bleeding continued one year at irregular intervals.	Submucous fibroid size of walnut found.
Case 6 34	Menorrhagia and metrorrhagia, uterus enlarged two times suspended to abdominal wall	Radium and high voltage x-ray	Bearing down sensation, feeling of pressure.	5 cm. fibroid, partly calcified, found.
Case 7 36	Pressure lower abdomen; size five months pregnancy	Radium and high voltage x-ray	Pressure remained.	Multiple fibroids found.
Case 8 44	Menorrhagia; size four months pregnancy	High voltage x-ray	Operated two weeks after last treatment upon advice of surgeon. No indication.	Uncomplicated fibroid found.
Case 9 53	Menorrhagia and metrorrhagia; uterus nodular, slightly enlarged	Radium	Continued bleeding.	Carcinoma, fundus found.
Case 10 39	Menorrhagia, size five months pregnancy	High voltage x-ray	Operated ten days after last x-ray treatment. No apparent indication.	Uncomplicated fibroid found.
Case 11 35	Menorrhagia, tumor size five months pregnancy	High voltage x-ray	Operated 2 wks. after last treat. upon advice of surg. No indications from hist.	Hysterectomy, uncomplicated fibroid found.
Case 12 63	Pressure, metrorrhagia	High voltage x-ray	Bleeding and pressure continued.	Multiple fibroids, intraligamentary ovarian cyst found.
Case 13 53	Menorrhagia and metrorrhagia, uterus nodular, enlarged three times	High voltage x-ray	Bleeding continued.	Carcinoma, fundus hysterectomy.
Case 14 38	Menorrhagia and metrorrhagia, tumor size of five months pregnancy	High voltage x-ray	Bleeding continued.	Hysterectomy, four months later showed carcinoma.
Case 15 46	Menorrhagia and metrorrhagia, uterus enlarged two times and nodular	Radium and high voltage x-ray	Bleeding continued.	Carcinoma of fundus found.
Case 16 43	Menorrhagia and pressure, tumor size five months pregnancy	Low voltage x-ray	Operated before treatments were completed.	Uncomplicated fibroid tumor.
Case 17 63	Metrorrhagia, menopause nine year ago, uterus enlarged two times	Radium	Bleeding continued.	Carcinoma, fundus found.

therapeutic department which best suits the individual case. For several years, following the custom of gynecologists in Europe, my office has been equipped with deep x-ray therapy and radium apparatus, to be used as a therapeutic adjunct. I am satisfied that a large number of these patients are best treated by radiation. While the operation of supracervical amputation has a very low mortality the fact remains that an occasional death is a factor against it. From an economic standpoint, the expense of radiation therapy is about the same, with the exception that the hospital and nurse expenses are eliminated. In addition, the patient treated with radiation loses no time from her household duties, experiences no pain, and the mortality rate is practically nil. The secret of success lies in the proper selection of the method of treatment. In the surgical group, I include all cases where the size of the fibromyoma is larger than the size of a four months' pregnancy, pedunculated types, those with a calcareous degeneration, and cases showing positive evidence of infected uterine adnexa. Those that have decided pressure symptoms I usually treat by radiation prior to operation, in order to relieve the pressure by reducing the size of the growth. The lacerated and eroded cervix present in women possessing fibroids is always treated with the actual cautery, whether the case is handled radiologically or surgically. The diseased cervix is always a factor to be considered and should never be overlooked. I use radiation in all cases with decided bleeding, excepting the submucous type. The hemorrhage is controlled by radiation, and transfusion is then made whether the case be surgical or radiological. The addition of fresh blood to the partially exsanguinated woman is of tremendous help in raising the vitality of the patient. Frank Lynch has called our attention to coexistence of goiter with fibroids. The exact cause and relationship of these conditions is not definitely known. To my own satisfaction, I have demonstrated on several occasions that in the treatment of fibroids, radiation, especially the x-ray, not only cures the fibroid but decidedly benefits the goiter. I have seen the metabolism drop and the goiter shrink after the treatment of fibroids by x-ray therapy.

✱

DOCTOR COSTOLOW (closing).—I am especially glad to have Doctor Toland discuss our paper, as he has referred about one-fifth of this entire series of cases to us for treatment and consequently knows personally of the good results obtained in a large number of the cases.

Doctor Emge's point regarding radiation before the age of thirty-five is well taken. As shown in our tables, only about 12 per cent of our cases were under this age limit and about half of these were treated without the production of a permanent menopause. In our cases, as far as we could ascertain, the complete loss of the sex impulse did not occur. A number of the younger individuals were single and this factor could not be determined. However, the menopausal symptoms in these cases were not different from those occurring after hysterectomy in the average young individual. The age factor is not so important in the fibromyoma problem, as the vast majority of cases do not show symptoms which call for treatment until they have passed the age of thirty-five.

I do not believe the use of the cautery in the cervix, as outlined by Doctor Gilbert, will be necessary if combined radium and x-ray therapy is used. As brought out in our paper, the cervix will become small and atrophic after radium treatment and any inflammatory process will entirely disappear.

We are grateful to the discussers of this paper for their valuable comments, and to the members of the medical profession for the confidence shown in referring this large group of patients to us for treatment. Twenty-six patients of this series were the wives of Southern California physicians.

## MENTAL DISTURBANCES IN TUMOR OF THE BRAIN\*

REPORT OF CASES

By I. LEON MEYERS, M. D.

Los Angeles

DISCUSSION by Charles Lewis Allen, M. D., Los Angeles; Walter F. Schaller, M. D., San Francisco; Jewel Fay, M. D., San Francisco.

**TUMORS** of the brain are not infrequently associated with severe mental changes. These mental changes, in some instances, may be so conspicuous as to overshadow the physical signs and obscure the organic nature of the trouble. Such patients, on the assumption that they have functional psychoses, are placed in institutions for the insane, where they may be given only custodial care. The origin of the trouble may be disclosed only at postmortem. Cases of this type have been reported from numerous state hospitals for the insane. According to the United States Census Bureau of the year 1926, on patients in hospitals for mental diseases in 1923,<sup>1</sup> the incidence of brain tumor among these patients was .1 per cent. A larger percentage is reported in Swalm's<sup>2</sup> Index of Postmortems from the State Hospital for the Insane at Harristown, Pennsylvania, where thirty out of 1638 autopsies showed tumors of the brain.

At the psychopathic department of the Los Angeles General Hospital, where patients with mental disturbances are kept only for a short period of observation, on numerous occasions the writer has discovered patients with tumors of the brain. These have promptly been transferred to the neurologic division of the hospital, where appropriate treatment, radical or palliative, has been instituted. It is, of course, unnecessary to dwell on the importance of recognizing these cases early if the best results from surgical treatment are to be obtained. In this communication certain characteristics of the mental manifestations of tumors of the brain which may aid us in determining their true origin will be briefly indicated.

### THE IMMEDIATE CAUSE IN THE PRODUCTION OF MENTAL DISTURBANCES IN TUMORS OF THE BRAIN

In his recent book on this subject, Henri Baruk<sup>3</sup> divides these symptoms into two groups.

One group which includes, according to him, mental retardation, disorientation as to time and space, and even fully developed dementia, he attributes to the general intracranial pressure produced by the tumors. These mental changes in this group, he asserts, do not depend upon an involvement of a particular region of the brain.

The other group which includes, according to him, euphoria, childishness, moria (the "Witzelsucht" of the Germans), delusions and hallucinations, simple or complex, are, he states, focal in character, being determined by the particular regions of the brain which are the seat of the tumor. This view, that severe mental disturbances—leaving out of consideration the depression and irri-

\* Read before the Neuropsychiatry Section of the California Medical Association at its Fifty-Seventh Annual Session, April 30 to May 3, 1928.